

**Notice of Allowability**

Application No.

09/900,992

Applicant(s)

HASEGAWA ET AL.

Examiner

Christopher R. Magee

Art Unit

2627

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 01/25/2006.
2. ☒ The allowed claim(s) is/are 1,2 and 9-16.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/25/2006 has been entered.

***Response to Amendment***

2. The reply filed 1/25/2006 was applied to the following effect: All relevant objections and rejections are withdrawn as being satisfied.

***Examiner's Amendment***

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Cancel claims 17-34.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Gustavo Siller on Wednesday, 3/29/2006.

*Reasons for Allowance*

4. Claims 1, 2 and 9-16 are allowed.

The following is an examiner's statement of reasons for allowance:

This application is for an EXCHANGE COUPLING FILM AND MAGNETORESISTIVE ELEMENT USING THE SAME.

- **Claim 1** specifies an exchange coupling film, which requires:

*“in a section of the exchange coupling film in parallel with a thickness direction thereof, crystal grain boundaries formed in the antiferromagnetic layer and crystal grain boundaries formed in the ferromagnetic layer extend in nonparallel direction with respect to an interface between the ferromagnetic layer and antiferromagnetic layer and are discontinuous in a least a portion of the interface.”*

Hasegawa '647 discloses an exchange coupling film comprising an antiferromagnetic layer [4] and a ferromagnetic layer [3], which are formed in contact with each other so that the magnetization direction of the ferromagnetic layer is pinned in a predetermined direction by an exchange coupling magnetic field produced at the interface between both layers, wherein the antiferromagnetic layer is made of an antiferromagnetic material comprising an element X (at least one element selected from Pt, Pd, Ir, Rh, Ru, and Os) and Mn; [Hasegawa English translation, section 0017] and in a section of the exchange coupling film in parallel with the thickness direction thereof, the crystal grain boundaries formed in the antiferromagnetic layer and the crystal grain boundaries formed in the ferromagnetic layer are discontinuous in at least a portion of the interface [Hasegawa English translation, section 0017].

However, Hasegawa '647 does not show, teach or suggest in a section of the exchange coupling film in parallel with a thickness direction thereof, crystal grain boundaries formed in the antiferromagnetic layer and crystal grain boundaries formed in the ferromagnetic layer

Art Unit: 2627

extend in nonparallel direction with respect to an interface between the ferromagnetic layer and antiferromagnetic layer and are discontinuous in a least a portion of the interface as claimed in the present invention.

Therefore, these features, in combination with other features of claim 1, are not anticipated by, nor made obvious over, the closest prior art of record of Hasegawa et al. (JPO English machine translation of JP 11-191-647, publication date 7/13/1999).

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (571) 272-7592. The examiner can normally be reached on M-F, 8: 00 am-4: 30 pm.

7. PLEASE NOTE the recent change in art unit designation from art unit 2653 to art unit 2627.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2627

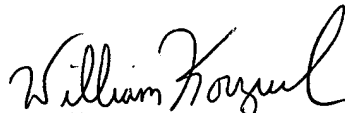
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christopher R. Magee  
Patent Examiner  
Art Unit 2627

March 29, 2006

crm



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